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LETTER REPORT
FOR 12/8/00
HOPKINS AIRPORT DISCHARGE SITE
CLEVELAND, CUYAHOGA COUNTY, OHIO
TDD: S05-0007-010
PAN: OU1001RZXX
START DOCUMENT CONTROL NUMBER: START-05-23-050121

December 8, 2000

Prepared for:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604

Prepared by: Drew Pearce Date: 12/8/00
Drew D. Pearce, START Project Manager

Reviewed and Approved by: Anne A. Busher Date: 12.13.00
Anne A. Busher, START Assistant Program Manager

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December 8, 2000

Ms. Gail Nabasny
START Project Officer
Emergency Response Branch
U.S. Environmental Protection Agency (SE-5J)
77 West Jackson Boulevard
Chicago, Illinois 60604

Re: Hopkins Airport Discharge Site
Cleveland, Cuyahoga County, Ohio
TDD: S05-0007-010
PAN: 0U1001RZXX

Dear Ms. Nabasny:

On July 14, 2000, the United States Environmental Protection Agency (U.S. EPA) tasked the Ecology and Environment, Inc., Superfund Technical Assessment and Response Team (START) to respond to and investigate a report from the National Aeronautics and Space Administration (NASA) Glenn Research Center regarding odors from a tributary to Abram Creek which runs through the NASA property. START was tasked under Technical Direction Document (TDD) number S05-0007-010 to conduct site assessment, sampling, and documentation activities at the Hopkins Airport Discharge Site. Under the direction of U.S. EPA Region 5 On-Scene Coordinator (OSC) Joe Fredle, site activities were conducted on July 14 and July 25, 2000, by START member Drew Pearce.

Site Location and Background

The Hopkins Airport Discharge Site (Site) is located on the property of the NASA Glenn Research Center at 21000 Brookpark Road in Cleveland, Cuyahoga County, Ohio. The geographical coordinates of the Site are latitude 41°24'12.6"N and longitude 81°52'04"W (Attachment A). The Site consists of seven storm sewer outfalls from Cleveland Hopkins International Airport (CHIA; located east of the NASA property) which discharge into the Rocky River, Abram Creek, and their tributaries, which run through the NASA property to the south, west, and north (Attachment B). Two of the outfalls (RETF-01 and RETF-02), which discharge

to a major and a minor tributary to Abram Creek, respectively, are located south of the Rocket Engine Test Facility (RETF; S-40) at the southern end of the NASA property. The approximate flow rates of these outfalls are 274 gallons per minute (GPM) for RETF-01 and 30 GPM for RETF-02. Outfall #015, located northwest of the entrance driveway to the NASA property, discharges to the Rocky River over a cliff and has an approximate flow rate of 40 GPM. Outfall #017, located northwest of the entrance driveway at a construction site, also discharges to the Rocky River and has an approximate flow rate of 135 GPM. Outfall #008, located adjacent to Building 135 (Vertical Lift Facility area), discharges to Abram Creek and has an approximate flow rate of 20 GPM. Finally, a double outfall set (CAOF-001E and CAOF-001W), located north of the airport and the NASA property (east of Grayton Road), discharges to a tributary of the Rocky River. Outfall CAOF-001E has an approximate flow rate of 36 GPM, and Outfall CAOF-001W has an approximate flow rate of 19 GPM.

On previous occasions, representatives from the NASA Glenn Research Center have notified U.S. EPA Region 5 in regards to odors detected by NASA employees who work at the RETF. NASA officials discovered that the odors were coming from a tributary to Abram Creek, which runs through the RETF area and flows north to Abram Creek. This tributary originates from a CHIA outfall (RETF-01). A significant amount of a white- to pink-colored bacterial growth is visible coating the inside of the 96-inch CHIA outfall (RETF-01) and on most of the rocks which form the bed of the tributary.

The CHIA utilizes a solution containing ethylene and/or propylene glycol to deice airplanes during the winter months. Additionally, in the past the CHIA is suspected to have utilized a solution containing urea to melt ice on the airport runways during the winter months. Potassium acetate is currently utilized by the airport to "salt" the runways in the winter. Ethylene glycol is a clear, colorless, odorless, viscous liquid with a sweet taste, that, when ingested, breaks down into metabolites that are highly toxic. Some enteric bacteria are able to break down urea into ammonia and carbon dioxide. In a body of water, nitrogen in the form of ammonia(ium), in high concentrations, is toxic to fish. Ammonia(ium), in low concentrations, and nitrates serve as nutrients for excessive growth of algae and other microorganisms. Also, the conversion of ammonia(ium) to nitrates consumes large quantities of dissolved oxygen in water.

Site Activities

On July 14, 2000, at approximately 1345 hours, following notification by a representative from NASA, OSC Fredle dispatched START to provide technical assistance and emergency response support, including stream water monitoring and outfall water sampling. At approximately 1515 hours, START member Drew Pearce arrived on site at the NASA Glenn Research Center and met with OSC Fredle and Dan Papcke, NASA Environmental Engineer. At approximately 1615 hours, OSC Fredle, START, and the NASA representative began walking along the tributary to Abram Creek starting at the parking area of the RETF (S-40) and ending at the 96-inch CHIA outfall (RETF-01) which forms the origin of the tributary at the southern end of the NASA property. From this outfall, the tributary was observed to flow north to Abram Creek. An excessive amount of a white- to pink-colored bacterial growth was observed coating the inside of

the CHIA outfall and on most of the rocks which form the bed of the tributary. A musty odor, similar to that of decaying organic matter, was apparent along the entire length of the tributary and around the parking area of the RETF. Heavy rainfall occurred during 1200 to 1300 hours, and the levels of moisture in the air were still elevated during the initial emergency response activities performed on this day.

OSC Fredle and START conducted air monitoring along the tributary and around the RETF parking area. Colorimetric indicator tubes, specific to ammonia, indicated the presence of ammonia at a concentration of less than 0.25 ppm. Air monitoring readings with a photo-ionization detector and a combustible gas indicator/oxygen meter were observed to be not above background levels at the NASA property.

At approximately 1630 hours, START collected one grab water sample from the CHIA outfall (RETF-01). The pH of the water coming from the CHIA outfall was observed to be 8.0 standard units (s.u.). The field screening result for ammonium (NH_4^+) at this sample location was approximately 30 parts per million (ppm). Additionally, START field screened the tributary to Abram Creek in a pool downstream from the CHIA outfall near the RETF parking area (upstream from the culvert). The field screening results at this location were approximately 30 ppm of ammonium and a pH of 7 s.u. Laboratory analytical results for this sample were 16 milligrams per liter (mg/L) of nitrogen (ammonia) and less than 10 mg/L of ethylene and propylene glycol.

On July 25, 2000, OSC Fredle and START Pearce returned to the Site to continue stream water monitoring and outfall water sampling activities. START collected grab water samples from all seven of the CHIA outfalls for the following laboratory analytical parameters: acetic acid, ethylene glycol, propylene glycol, and ammonia. Additionally, START collected a sample of the bacterial growth from the rock bed of the tributary to Abram Creek at outfall location RETF-01. START conducted stream water quality monitoring at the seven CHIA outfalls and at a location downstream from outfalls RETF-01 and -02 in the tributary to Abram Creek (Attachment C). START collected stream water quality data for the following parameters: pH, temperature, dissolved oxygen (DO), and ammonium. Additionally, OSC Fredle and START collected data on outfall dimensions and flow velocities in order to calculate volume discharge rates for each of the seven CHIA outfalls.

Outfall #017 had the following water quality field results: pH of 6.0 s.u., temperature of 20° C, 6.0 mg/L of DO, and 10 ppm of ammonium. Outfall RETF-01 had the following water quality field results: pH of 7.5 s.u., temperature of 20° C, 2.2 mg/L of DO, and 20 to 30 ppm of ammonium. Outfall CAOF-001W had the following water quality field results: pH of 7.5 s.u., temperature of 20° C, 6.0 mg/L of DO, and 30 ppm of ammonium. Musty odors were detected and significant bacterial growth was visible at all three of the aforementioned outfall locations, especially at outfalls RETF-01 and CAOF-001W. Outfalls RETF-01 and CAOF-001W had the highest levels of ammonium, lowest levels of DO, and the most extensive amount of bacterial growth and odors in and around the outfalls compared to the other five CHIA outfalls. Stream water monitoring and outfall water sampling activities were conducted by START from 1000 to

1730 hours. At 1800 hours, START demobilized from the Site.

Analytical Results

Laboratory analytical results and data quality review for the outfall water samples, collected by START on July 25, 2000, are shown in Attachment D. Concentrations of acetic acid, ethylene glycol, and propylene glycol in all of the outfall water samples, including the sample collected on July 14, 2000, were below the laboratory detection limits for these analytical parameters. Nitrogen (ammonia) concentrations were the highest in samples from outfalls RETF-01 (i.e., 19 mg/L) and CAOF-001W (i.e., 24 mg/L).

The bacteriological sample, collected by START from the rock bed of the tributary to Abram Creek at outfall RETF-01 on July 25, 2000, was analyzed by a microbiologist for genus identification. The majority of the sample consisted of "colorless sulfur bacteria" from the genus *Beggiatoa*. Bacteria of this genus are microaerophilic, meaning these microorganisms grow in habitats with low oxygen levels (i.e., 2-10% oxygen), and they are often found in sulfide-rich habitats such as fresh water with decaying plant material. Other characteristics of this genus are the following:

- very versatile metabolically
- can oxidize hydrogen sulfide
- many species can also grow heterotrophically with acetate as a carbon source, and some may incorporate carbon dioxide autotrophically
- filamentous gliding bacteria
- form pinkish mats in water

The remaining bacteria identified in the sample were of miscellaneous heterotrophic genera. No algae genera were identified by the microbiologist.

Sincerely,

Drew D. Pearce
START Project Manager

Anne A. Busher
Assistant START Program Manager

Attachments:
- A Site Location Map
- B Site Features Map
- C Stream Water Quality and Outfall Flow Data
- D Outfall Water Sampling Analytical Results and Data Quality Review Memorandum

cc: Joe Fredle, U.S. EPA OSC, Westlake, Ohio
File

Attachment A

Site Location Map

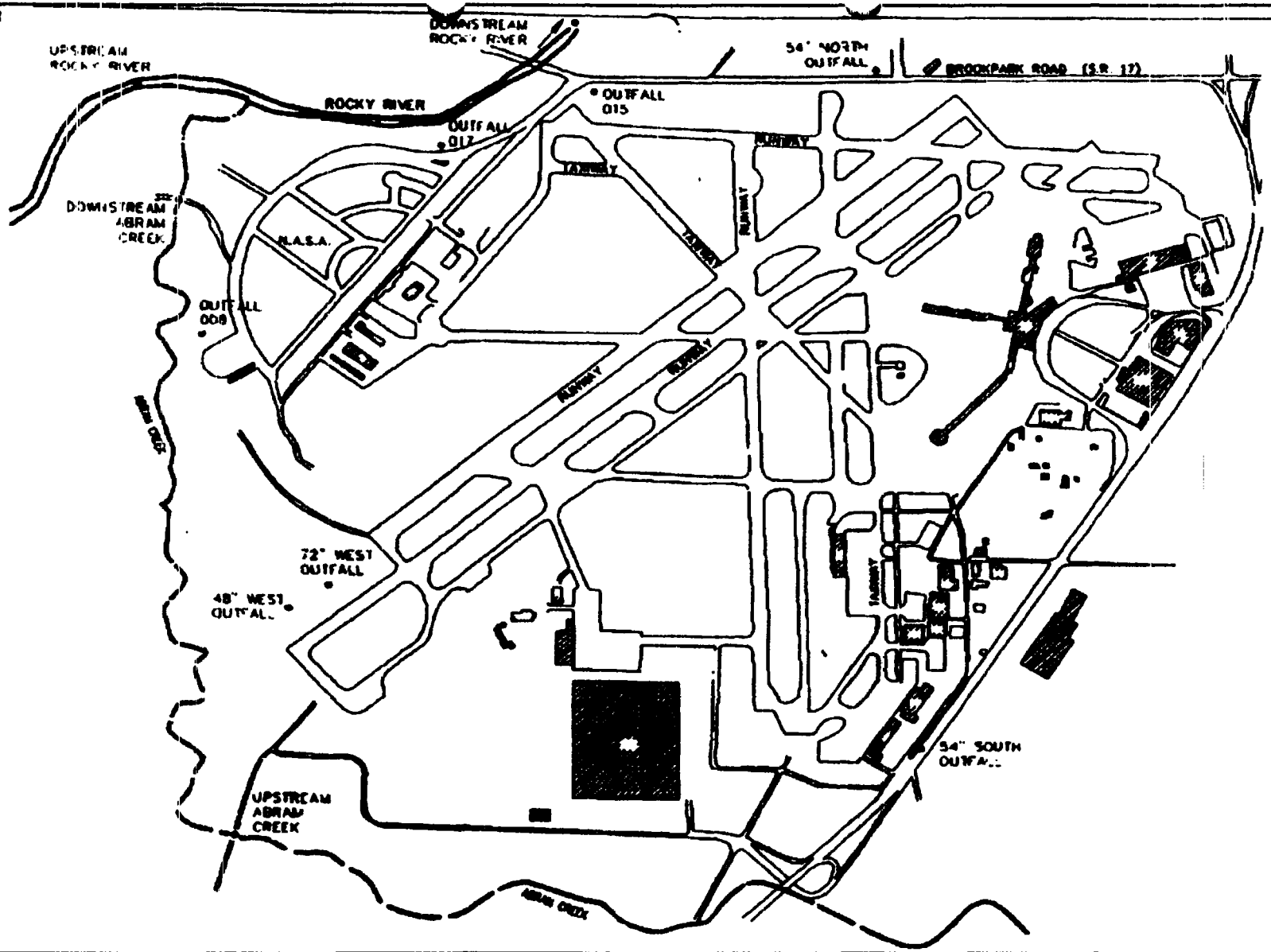
Quadrangle Location

Ecology and Environment, Inc.
Region 5 - Superfund Technical Assessment and Response Team
6777 Engle Road, Suite N
Middleburg Heights, Ohio 44130

TITLE:	Site Location Map	ATTACHMENT:	A
SITE:	Hopkins Airport Discharge	SCALE:	Not to scale
CITY:	Cleveland STATE: Ohio	TDD:	S05-0007-010
SOURCE:	USGS Topographic Map 7.5' Series Lakewood Quadrangle Ohio - Cuyahoga County	DATE:	1963
		REVISED:	1985

Attachment B

Site Features Map



Legend

Ecology and Environment, Inc.
Region 5 - Superfund Technical Assessment and Response Team
9777 Engle Road, Suite H
Middleburg Heights, Ohio 44130

TITLE: Site Features Map	ATTACHMENT: B
SITE: Hopkins Airport Discharge	SCALE: Not to Scale
CITY: Cleveland STATE: Ohio	TDD S05-0007-010
SOURCE: NASA Glenn Research Ctr.	DATE: July 14, 2000

Attachment C

Stream Water Quality and Outfall Flow Data

Stream Water Quality and Outfall Flow Data								
Date	**Time**	**Outfall/ Location**	**pH**	**Temp. (°C)**	**D.O. (mg/L)**	**Field NH_4^+ (mg/L)**	**Outfall Flow Rate (GPM)**	**Comments**
7/25/00	1120	#015	6.5	21	8.5	10	40.21	Cliff/drop-off; discharge to Rocky River
7/25/00	1015	#017	6.0	20	6.0	10	134.64	Odor/bacteria; discharge to Rocky River
7/25/00	1300	#008	6.7	23	8.0	0-10	19.66	Discharge to Abram Creek
7/25/00	1420	RETF-01	7.5	20	2.2	20-30	274.33	Odor/bacteria; discharge to trib. of Abram Ck.
7/25/00	1545	RETF-02	7.2	19	9.0	0-5	29.93	Discharge to minor trib. to trib. of Abram Ck.
7/25/00	1700	CAOF-001E	8.4	19	9.6	0-5	36.31	Double outfall set (east/left)
7/25/00	1710	CAOF-001W	7.5	20	6.0	30	18.70	Odor/bacteria; double outfall set (west/right)

Key:

D.O. - Dissolved oxygen
GPM - Gallons per minute
mg/L - Milligrams per liter
NH_4^+ - Ammonium

Source: Ecology and Environment, Inc., 2000

Attachment D

Outfall Water Sampling Analytical Results and Data Quality Review Memorandum

OUTFALL WATER SAMPLING ANALYTICAL RESULTS

HOPKINS AIRPORT DISCHARGE SITE
CLEVELAND, CUYAHOGA COUNTY, OHIO
Sample Date: July 25, 2000
(unit = mg/L)

Analytical Parameters	Sample Locations						
	NOF-015	NOF-017	NOF-008	RETF-01	RETF-02	CAOF-001E	CAOF-001W
Acetic Acid	<100	<100	<100	<100	<100	<100	<100
Ethylene Glycol	<10	<10	<10	<10	<10	<10	<10
Propylene Glycol	<10	<10	<10	<10	<10	<10	<10
Nitrogen (Ammonia)	16	9.5	<0.05	19	1.0	0.46	24

Key:

mg/L - Milligrams per liter

Source: ELS Analytical Services, Inc., South Bend, Indiana (Analytical TDD: S05-0007-805)

ecology and environment, inc.
International Specialists in the Environment

33 North Dearborn Street
Chicago, Illinois 60602
Tel. 312/578-9243, Fax: 312/578-9345

M E M O R A N D U M

DATE: August 17, 2000

TO: Drew Pearce, START Project Manager, E & E, Cleveland, Ohio

FROM: David Hendren, START Analytical Services Manager, E & E, Chicago, Illinois

THROUGH: Patrick Zwilling, START Assistant Program Manager, E & E, Chicago, Illinois

SUBJECT: Data Quality Review for Ethylene Glycol, Propylene Glycol, and Acetic Acid, Hopkins Airport Discharge, Cleveland, Cuyahoga County, Ohio

REFERENCE: Project TDD S05-0007-010 Analytical TDD S05-0007-805
Project PAN 0U1001RZXX Analytical PAN 0UAE01TAXX

The data quality assurance (QA) review of eight water samples collected from the Hopkins Airport Discharge site is complete. One sample was collected on July 14, 2000, and seven samples were collected on July 25, 2000, by the Superfund Technical Assessment and Response Team (START) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to EIS Analytical Services, Inc., South Bend, Indiana. The laboratory analyses were performed according to the United States Environmental Protection Agency (U.S. EPA) Solid Waste 846 Method 8015.

Sample Identification

START Identification No.	Laboratory Identification No.
CAOF-01	69640
NOF-017	69797
NOF-015	69798
NOF-008	69799
RETF-01	69800
RETF-02	69801
CAOF-0015	69802
CAOF-001W	69803

Data Qualifications:

I. Sample Holding Time: Acceptable

The samples were collected on July 14 and 25, 2000, and analyzed on July 24 and 27, 2000. The Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990) does not specify holding times for these parameters.

II. Calibrations: Acceptable

The percent relative standard deviations of the response factors were less than 20% in the initial calibration.

III. Blanks: Acceptable

Blanks were analyzed with each analytical batch. None of the analytes were detected above the reporting limits in the blanks.

IV. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on criteria for QA Level II as outlined in OSWER Data Validation Procedures, Section 9.0, Generic Data Validation Procedures. Based upon the information provided, the data are acceptable for use.

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33 North Dearborn Street
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M E M O R A N D U M

DATE: August 17, 2000

TO: Drew Pearce, START Project Manager, E & E, Cleveland, Ohio

FROM: David Hendren, START Analytical Services Manager, E & E, Chicago, Illinois

THROUGH: Patrick Zwilling, START Assistant Program Manager, E & E, Chicago, Illinois

SUBJECT: Data Quality Review for Ammonia, Hopkins Airport Discharge, Cleveland, Cuyahoga County, Ohio

REFERENCE: Project TDD S05-0007-010 Analytical TDD S05-0007-805
Project PAN 0U1001RZXX Analytical PAN 0UAE01TAXX

The data quality assurance (QA) review of eight water samples collected from the Hopkins Airport Discharge site is complete. One sample was collected on July 14, 2000, and seven samples were collected on July 25, 2000, by the Superfund Technical Assessment and Response Team (START) contractor, Ecology and Environment, Inc. (E & E). The samples were submitted to EIS Analytical Services, Inc., South Bend, Indiana. The laboratory analyses were performed according to the United States Environmental Protection Agency (U.S. EPA) Method 350.1.

Sample Identification

START Identification No.	Laboratory Identification No.
CAOF-01	69640
NOF-017	69797
NOF-015	69798
NOF-008	69799
RETF-01	69800
RETF-02	69801
CAOF-0015	69802
CAOF-001W	69803

Data Qualifications:

I. Sample Holding Time: Acceptable

The samples were collected on July 14 and 25, 2000, and analyzed on July 21 and 28, 2000. The Office of Solid Waste and Emergency Response (OSWER) Directive 9360.4-01 (April 1990) does not specify holding times for this parameter.

II. Calibrations: Acceptable

The correlation coefficient of the initial calibration exceeded 0.995. The recovery of the daily recovery standards were within 80 to 120 %.

III. Blanks: Acceptable

Blanks were analyzed with each analytical batch. Ammonia was not detected above the reporting limits in the blanks.

IV. Overall Assessment of Data for Use: Acceptable

The overall usefulness of the data is based on criteria for QA Level II as outlined in OSWER Data Validation Procedures, Section 9.0, Generic Data Validation Procedures. Based upon the information provided, the data are acceptable for use.

SAMPLE RESULTS

Client Name: Ecology & Environment, Inc.
Client Project: SO5-0007-805

Report Date: 8/1/00
EIS Order No: 000700156

EIS Lab Number	Client Description	Sample Date	Parameter	Result	Units	SDL	Test Date	Analyst	Method
069640	CAOF-01	7/14/00	Ethylene Glycol	<10	mg/L	10	7/24/00	CarlsenS	8015
		7/14/00	Nitrogen(Ammonia)	16	mg/L	0.05	7/21/00	SzkarlatM	350.1
		7/14/00	Propylene Glycol	<10	mg/L	10	7/24/00	CarlsenS	8015
069797	NOF-017	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	9.5	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069798	NOF-015	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	16	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069799	NOF-008	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	<0.05	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069800	RETF-01	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	19	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069801	RETF-02	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	1.0	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069802	CAOF-001E	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	0.46	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
069803	CAOF-001W	7/26/00	Acetic Acid	<100	mg/L	100	7/27/00	CarlsenS	8015
		7/26/00	Ethylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015
		7/26/00	Nitrogen(Ammonia)	24	mg/L	0.05	7/28/00	SzkarlatM	350.1
		7/26/00	Propylene Glycol	<10	mg/L	10	7/27/00	CarlsenS	8015